

CLAIMS

What is Claimed is:

1. A method for detecting defects in a reticle used in integrated circuit chip fabrication, said method comprising:
 - (a) obtaining digital image data corresponding to an image of a reticle;
 - (b) processing the digital image data according to predetermined criteria to
- 5 identify defects; and
 - (c) simulating a response that would be produced if the reticle were to be utilized in a photolithographic system, by processing the digital image data corresponding to the reticle.
2. A method according to Claim 1, wherein the digital image data are obtained by scanning the reticle.
3. A method according to Claim 1, wherein the defects are identified in step (b) by comparing the digital image data to reference digital image data.
4. A method according to Claim 1, wherein step (c) simulates an aerial image which would be produced by the reticle.
5. A method according to Claim 1, further comprising a step of categorizing defects based on simulation results produced in step (c).
6. A method according to Claim 1, wherein the digital image data are in raster format.
7. A method according to Claim 1, further comprising a step of modifying a format of the digital image data prior to performing step (c).

8. A method according to Claim 1, further comprising a step of providing a reference simulation for comparison to a simulation produced in step (c).

9. A method for detecting defects in a reticle used in integrated circuit chip fabrication, said method comprising:

- (a) obtaining digital image data corresponding to an image of a reticle;
- (b) processing the digital image data according to predetermined criteria to
5 identify defects;
- (c) specifying a window around one of the defects identified in step (b); and
- (d) simulating a response that would be produced if the window specified in step (c) were to be utilized in a photolithographic system, by processing digital image data corresponding to the window specified in step (c).

10. A method according to Claim 9, wherein the digital image data are obtained by scanning the reticle.

11. A method according to Claim 9, wherein step (d) simulates an aerial image which would be produced by the window.

12. A method according to Claim 9, further comprising a step of categorizing defects based on simulation results produced in step (d).

13. A method according to Claim 9, further comprising a step of simulating a window of corresponding reference image data for comparison to simulation results produced in step (d).

14. A method according to Claim 9, wherein the window is 64 x 64 pixels.

15. A method according to Claim 9, wherein the digital image data processed in step (d) are grayscale data.

16. A method according to Claim 9, wherein the defects are identified in step (b) by comparing the digital image data to reference digital image data.

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AI 17. An apparatus comprising a computer readable medium having encoded thereon computer-executable process steps, said process steps for detecting defects in a reticle used in integrated circuit chip fabrication, wherein said process steps comprise steps to:

- 5 (a) obtain digital image data corresponding to an image of a reticle;
- (b) process the digital image data according to predetermined criteria to identify defects; and
- (c) simulate a response that would be produced if the reticle were to be utilized in a photolithographic system, by processing the digital image data
- 10 corresponding to the reticle.

18. An apparatus according to Claim 17, wherein said computer readable medium comprises at least one of a magnetic diskette, magnetic tape, a CD-ROM, a random access memory chip, and a read-only computer memory chip.

19. An apparatus comprising a computer readable medium having encoded thereon computer-executable process steps, said process steps for detecting defects in a reticle used in integrated circuit chip fabrication, said process steps comprising steps to:

- 5 (a) obtain digital image data corresponding to an image of a reticle;
- (b) process the digital image data according to predetermined criteria to identify defects;
- (c) specify a window around one of the defects identified in step (b); and
- (d) simulate a response that would be produced if the window specified in step
- 10 (c) were to be utilized in a photolithographic system, by processing digital image data corresponding to the window specified in step (c).

20. An apparatus according to Claim 19, wherein said computer readable medium comprises at least one of a magnetic diskette, magnetic tape, a CD-ROM, a random access memory chip, and a read-only computer memory chip.

21. An apparatus for detecting defects in a reticle used in integrated circuit chip fabrication, said apparatus comprising:

a processor for executing stored program instruction steps; and

a memory connected to the processor for storing the program

5 instruction steps,

wherein the program instruction steps include steps to:

(a) obtain digital image data corresponding to an image of a reticle;

10 (b) process the digital image data according to predetermined criteria to identify defects; and

(c) simulate a response that would be produced if the reticle were to be utilized in a photolithographic system, by processing the digital image data corresponding to the reticle.

22. An apparatus for detecting defects in a reticle used in integrated circuit chip fabrication, said apparatus comprising:

a processor for executing stored program instruction steps; and

a memory connected to the processor for storing the program

5 instruction steps,

wherein the program instruction steps include steps to:

(a) obtain digital image data corresponding to an image of a reticle;

10 (b) process the digital image data according to predetermined criteria to identify defects;

(c) specify a window around one of the defects identified in step (b); and

